A RELIC OF ANCIENT MEXICO.

THE appearance of No. 1 of the *Peabody Museum Papers* marks a new departure in the publications of the Museum of American Archæology and Ethnology. Henceforth, Prof. F. W. Putnam states, the special papers, hitherto published in connection with the Annual Reports, will be issued in a separate but similar octavo form at irregular intervals, as the means for printing them is obtained. Part 1 of vol. i. of this new series, just received, consists of an interesting and thoughtful historical essay on a relic of ancient Mexico entitled "Standard or Head-dress," by Mrs. Zelia Nuttall, accompanied by three coloured plates. A quarto German translation by Dr. A. B. Meyer appeared in the last volume of the *Abhandlungen und Berichte des K. Zoologischen und Anthropologisch-Ethnographischen Museums zu Dresden*. It treats mainly of a remarkable piece of ancient Mexican feather-work inlaid with gold of the time of Montezuma, which was one of the first presents received and forwarded by Cortes to the Emperor Charles V. It subsequently formed part of the famous Ambras collection of historical armour, figuring in various catalogues of that collection as a "Moorish hat," an "Indian apron," and a "Mexican head dress," and is now preserved in the Imperial Natural History Museum of Vienna. It was carefully restored by the late Prof. F. von Hochstetter, who published in 1884 a description of it as a "banner" or "fan-shaped standard," basing this identification chiefly upon the resemblance it presented to a "fan-shaped object" depicted behind the portrait of a Mexican warrior in the "Bilimek" collection acquired by the Museum in 1878. In the present essay Mrs. Nuttall adduces abundant testimony that the feather piece in question was a head-dress which formerly presented all the attributes of colour, form, and insignia of the war-god Huitzilopochtli, the hero-god and totemic divinity of the Mexicans. Such head-gear could have been worn only at the time of the conquest by Montezuma, "the living representative of the god," as "supreme pontiff and chief warrior." An exactly similar emblematic head-dress, she points out, is depicted on the so-called "sacrificial stone" as worn by Jiz-oc, one of Montezuma's predecessors. It is further maintained that the painting of the "Bilimek" warrior must be regarded as a rebus and not as a portrait. The "fan-shaped object" is the insignia of Quetzal feathers, characterizing the high rank of the warrior, who was also a priest, and is represented as clad in a human skin. The house = *calli*, piece of cord = *mecatl*, and arrows = *tlacochtl*, similarly depicted, yield, together with the Quetzal feather insignia when deciphered with the aid of the associated complementary sign, the phonetic values: (1) the surname *Calmecahua*; (2) the title *Tlacochcalcatl* = lord of the house of arrows or supreme war-chief; and (3) the tribal designation *Quetzalapanecatl*, a native of Quetzalapan, a locality near Mexico conquered by the Mexicans in 1512. This renders probable the identification of the individual as that Calmecahua, or lord of the *calmecac*, who, as Diaz relates, "fought like a lion on the side of the Spaniards" at the battle of Otumba against his natural foes the Mexicans, and was afterwards baptized as Don Antonio, and is cited by Txtlilxochitl as the author of a history of Tlaxcala, written in 1548. However this may be, it is evident that he was a *pilhua*, or head of a large family, as Mrs. Nuttall shows that the heads, surmised by Dr. Hochstetter to be those of "decapitated enemies," painted at his feet, are the usual signs for enumerating individuals, by reference to other Mexican manuscripts extant, in which similar heads under a figure are accompanied by the Nahualtl word for genealogy, and in the case of a manuscript dating about 1520, in the possession of Mr. Bernard Quaritch, by the Nahuatl text in Spanish letters = "Tenancacaltzin these his sons' heads." In an appendix to this suggestive paper Mrs. Nuttall discusses the complementary signs of the Mexican graphic system.

SCIENTIFIC SERIALS.

Bulletin de l'Académie Royale de Belgique, October 1888.—On the influence of diurnal nutation in the discussion of the observations of α Lyræ, made at the Washington Observatory, by L. Niesten. In these researches, which are somewhat analogous to his previous observations on γ Draconis made at Greenwich, the author adduces a fresh proof of the existence of diurnal nutation. The coefficient resulting from his determination is 0·095″, giving 69° east of Paris as the longitude of the first meridian.—On a new registering process by means of photography, by Eric Gérard. In this ingenious apparatus, instead of using the voltaic arc as the source of the light falling on the concave mirror whose movements have to be recorded, the inventor employs the secondary spark supplied by the Ruhmkorff bobbin. This spark being periodical, owing to the elasticity of the check-spring of the bobbin, naturally gives the division of time in equal intervals inscribed on the registering curve. In this way the use of all special chronographs may be dispensed with. The author has applied the method to the study of the variable currents supplied by dynamos with alternate currents, and has obtained excellent results.—Jean Masius contributes a memoir on the genesis of the placenta in the rabbit, with a view to the elucidation of the difficult questions connected with the origin and purpose of various elements present in the fully developed placenta.

Rivista Scientifico-Industriale, November 15, 1888.—Granular snow and the theory of the formation of hail, by Prof. Ferdinando Palagi. The author had a good opportunity of studying the phenomenon of granular snow during a heavy snow-storm at Teramo on October 20. The grains, about the size of ordinary peas, were perfectly dry, falling with a clatter like that of hail, which they resembled somewhat in appearance, although evidently formed, not by superimposed layers of ice, but by particles of snow agglomerated under certain atmospheric and perhaps electrical conditions. They were relatively light, perfectly white and opaque, yielding under pressure between the fingers, and from their general appearance and the circumstances of their formation Prof. Palagi concluded that granular snow is the first phase in the formation of hail.—On the development of electricity from the evaporation of marine water under the exclusive action of the solar rays, by Prof. Luigi Palmieri. Some recent experiments with the Bohnenberger electroscope are here described, which fully confirm the conclusions already arrived at forty years ago by the author, and in fact anticipated by Volta, regarding the origin of atmospheric electricity from aqueous evaporation.—Signor Giuseppe Terrenzi describes some remains of the beaver (*Castor fiber*, Lin.) lately discovered in the Pliocene formations of the Colle dell' Oro near Terni.

SOCIETIES AND ACADEMIES.

LONDON.

Linnean Society, December 20, 1888.—Mr. W. Carruthers, F.R.S., President, in the chair.—Prof. R. J. Anderson exhibited a photograph of an apparatus for the microscope which he had designed, consisting of a revolving disk with clips, by means of which a number of slides may be successively brought opposite the microscope, which is fixed in a horizontal position in front of it.—Mr. Clement Reid exhibited fruit of the Hornbeam from the pre-glacial forest bed at Pakefield, near Norwich, and not previously recorded as occurring in any British deposit.—Mr. T Christy exhibited a collection received from Java of hairs from the base of various ferns, notably *Cibotium Cummingii*, and a species, as supposed, of *Dicksonia*, used as a styptic, for staunching blood. Prof. Stewart, in pointing out that the use of similar material for a like purpose in China was well known to surgeons, took occasion to explain the nature of the so-called "lamb of Tartary," on which an instructive little volume had been published by the late Mr. Henry Lee, F.L.S. Mr. D. Morris remarked that the use of "fern hairs" was also known as a styptic in South America, whence specimens had been forwarded to the Herbarium at Kew.—A paper was then read by Mr. D. Morris on the characteristics of plants included under *Erythroxylon Coca*, Lamarck, with a description of a new variety, which he proposed to name, from its origin, *E. novo-granatense*. He pointed out that the well-known coca-plant had been noticed by botanists and travellers for the last 300 years; and that, although Clusius was generally regarded as the earliest writer on it, he had been anticipated by Nicholas Monardes in his "Historia Medicinal," published at Seville in 1580, and translated by Clusius, who printed it in a condensed form in his "Exoticorum libri decem" in 1605. The plant was first described as a species by Lamarck, in the "Encyclopédie Méthodique" in 1786, from specimens brought by de Jussieu from Peru. Until lately the leaves had been used merely as a nervous stimulant, like opium in China, and betel in the East Indies; but had latterly come into prominence as the source of cocaine, a valuable alkaloid possessing anæsthetic properties in contact with the mucous membrane. There were several climatic forms more or less distinct; and after describing the typical plant, Mr. Morris pointed out the characters by which *E. novo-granatense* might be distinguished. The paper was ably criticized by Mr. J. G. Baker, Mr. Rolfe, and Mr. Thomas Christy.—Mr. Spencer Moore contributed a paper on *Apiocystis*, which he regarded as a *Volvocinea*. The ciliated form was described, and it was shown that its zoospores may sometimes escape as cœnobia, like a degenerate *Volvocinea* which has exchanged the motile for the fixed condition. The sexual cells being zoogametes, its affinity is rather with *Pandorineæ* than with oogamous *Volvoceæ*. The paper was criticized by Mr. A. W. Bennett and Prof. Marshall Ward, who, while testifying to the importance of the investigation, expressed the hope that no change would be made in classification until further examination had been made of some of the stages at a critical period of development. Mr. George Murray gave his warm support to the views expressed by Mr. Moore.—A paper was then read by Mr. G. B. Sowerby embodying descriptions of some new species of shells, of which coloured drawings were exhibited. Amongst these, the most noticeable were an *Orthalicus* from the Peruvian Andes, *Pleurotoma* (Hong Kong), *Amathina* (Mauritius), *Crassatella* (Japan), *Clavigella* (Mauritius), and *Pectunculus* (Australia). An interesting discussion followed, in which Prof. Stewart and Prof. Mivart took part, upon the coloration of Mollusca being possibly dependent upon the colour of their natural surroundings, or upon that of the host to which in many instances they were found to be attached.

Geological Society, December 19, 1888.—W. T. Blanford, F.R.S., President, in the chair.—The following communications were read:—*Trigonocrinus*, a new genus of Crinoidea from the "Weisser Jura" of Bavaria, with description of new species, *T. liratus*; Appendix I. Sudden deviations from normal symmetry in Neocrinoidea; and Appendix II. *Marsupites testudinarius*, Schl., sp., by F. A. Bather. This genus is proposed on the evidence of two calyces in the British Museum (Natural History) which were found among specimens of *Eugeniacrinus* from Streitberg. The species of *Eugeniacrinus*, *Phyllocrinus*, and *Trigonocrinus* may be arranged in a series which is apparently one of evolution. The present genus is, therefore, to be placed with the Eugeniacrinidæ, although its characters are not those of the family as heretofore defined. This is seen from the following diagnosis: *Trigonocrinus*, gen. nov. Calyx roughly triangular or trilobate in section. Basals 4, but one so atrophied as to be almost invisible; all fused into a basal ring. First radials 4; the two on either side of the smallest basal half the size of the others, thus maintaining the triangular symmetry; all closely united, with each suture-line in a groove. Processes of radials well developed, forming spines homologous with the petals of *Phyllocrinus*; except the adjacent processes of the smaller radials, which only form a minute ridge. Articular surface of radials curved gently inwards and upwards; muscular impressions indistinct or absent; no articular ridge; no canal-aperture. Arms unknown (? represented by fleshy appendages). Calycal cavity contained in first radials; with small round ventral aperture, surrounded by a rim, which is the only relic of a muscular attachment. Stem unknown. The two calyces belong to the same species, viz. *T. liratus*, sp. nov. Calyx rather more elongate than in the known species of *Phyllocrinus*; basals ornamented with minute granules; radials ornamented with similar granules run into curved ridges, which, owing to their differing intensity, give an imbricated appearance; spines, triangular in section, with the base of the triangle directed inwards, the apex outwards, the angles often rounded. The differentiation of *Trigonocrinus* from the central Eugeniacrinid type has been effected on the one hand in accordance with the principles of "Degeneration," "Reversion," and "Use and Disuse"; while, on the other hand, it exemplifies certain methods of change in organic forms, which may be referred to the categories of (1) sport, (2) hypertrophy and atrophy, (3) fusion and fission. Thus considered it is of unique interest among Crinoidea. An examination of the variations in symmetry presented by the Echinodermata suggests the conclusion that the Pentamerous type was originally evolved from another system, or at least that it was selected from among other variations, that it has survived, and that it has been kept true, as being the fittest. Appendix I. Sudden deviations from normal symmetry in Neocrinoidea. A collection of instances from previous authors, with a few additions, the whole illustrating the latter portion of the paper. Appendix II. On *Marsupites testudinarius*, von Schlotheim, sp. A synonymy of the genus *Marsupites*; it contains but one known species, and all other names must yield to this one. After the reading of this paper the President welcomed a new palæontologist to the Society, and some comments on the author's views were offered by Dr. P. H. Carpenter and Prof. Seeley.—On *Archæocyathus*, Billings, and on other genera allied thereto, or associated therewith, from the Cambrian strata of North America, Spain, Sardinia, and Scotland, by Dr. G. J. Hinde.—On the Jersey brick clay, by Dr. Andrew Dunlop.

PARIS.

Academy of Sciences, December 31, 1888.—M. Janssen in the chair.—Mean elevation of the continents and mean oceanic depths in relation to geographical latitude, by General Alexis de Tillo. Tables are given of the mean elevations and depths, in metres, for every zone of 10° of latitude from pole to equator in the northern and southern hemispheres, based on J. G. Bartholomew's hypsometric chart of the globe. The greatest mean heights and depths are found in the northern hemisphere, between 30° and 40°; in the southern, between 10° and 30°, which also correspond to the zones of greatest atmospheric action and mean annual pressure. The mean height of the dry land and the mean oceanic depth for the globe are found to be, respectively, 693 and 3803 metres.—Observation of shooting-stars for the period August 9-11, 1888, in Italy, by Père F. Denza. The results are tabulated of the records taken at twenty-nine Italian stations, showing the number of meteors observed in the space of one hour during the periodic showers on the nights of August 9, 10, and 11, 1888. These results differ considerably for the different stations, owing to the varying state of the atmosphere, the experience of the observers, and other causes; but, on the whole, the meteoric shower was tolerably copious compared with those of previous years.—On the volumes of saturated vapours, by M. Ch. Antoine. From the general relation established by Zeuner between the pressure and volume of aqueous vapour, formulas are here determined for the volumes of the vapour of water, ether, acetone, chloroform, chloride of carbon, and sulphide of carbon.—Propagation of the electric current on a telegraph line, by M. Vaschy. From a consideration of Sir W. Thomson's theory of propagation applied to long submarine lines, it is generally inferred that the currents are propagated along the line *without change of form*, their amplitude alone decreasing in geometric progression. An important practical consequence of this result is indicated for the working of telegraph lines, and this is stated to be also applicable to telephonic messages.—Action of sulphuretted hydrogen on the sulphate of zinc in a neutral or acid solution, by M. H. Baubigny. A current of hydrosulphuric gas passed through a *saturated* solution of zinc causes a portion of the metal to be precipitated; but the action is arrested when the solution becomes acid to a certain point of intensity. This statement of Berzelius is correct enough, as thus expressed. But the law deduced from its generalization for all cases is here shown to be false, and completely at variance with experience, especially when the solutions are diluted.—Artificial reproduction of chromiferous iron, by M. Stanislas Meunier. After repeated failures, the author has at last succeeded in obtaining this substance (*chromite*) by combining the protoxide of iron obtained from the carbonate with the sesquioxide of chromium obtained by the reduction of the bichromate of potassa.—A chemical study of the Algerian soils, by M. A. Ladureau. A careful analysis of samples from various parts of Algeria shows a general dearth of phosphates, which explains the inferior quality of the cereals grown in that colony.—Combination of the glycol-alcoholate of soda with glycol, by M. de Forcrand. The author has already shown that many alcoholates unite with one or more molecules of a monatomic alcohol to form more or less stable crystalline compounds analogous to the acid salts, and to the numerous hydrates of the salts, bases, or acids. Here, he shows further that glycol may combine in the same way with the glycol-alcoholate of soda at equal equivalents.—On the active crystalline substance extracted from the seeds of the smooth or hairless Strophanthus of the Gaboon, by M. Arnaud. An analysis of this substance, used by the Pahouins (Fans) for poisoning their arrow-heads, shows its close affinity to the wabaine of *Acokanthera Wabaio* from Somali-land, and the strophanthine of *Strophanthus Kombé*, from Senegambia, previously described by the author.—Biological and therapeutic experiments on cholera, by M. W. Loewenthal. A series of experiments undertaken last year with the cholera bacillus seems to show that salol might be advantageously administered both as a prophylactic and a therapeutic during the prevalence of the cholera epidemic.—On a deposit of fossil bones in the Island of Samos, contemporaneous with the Pikermi age, by Mr. Forsyth Major. This find is the result of a scientific exploration of some islands in the Ægean in the year 1887. It comprises some forty species of mammals, some of which have been identified beyond doubt with members of the Pikermi fauna. Amongst them are the Ictitherium (three species), a mastodon (*M. pentelici*), a rhinoceros, a hipparion (*H. mediterraneum*), *Sus erymanthius*, and seven antelopes. Representatives were also found of the two families of Edentates still living in the Old World; a gigantic Ruminant belonging to the giraffe family, but forming a new genus (*Samotherium boissieri*, Major); and an ostrich (*Struthio karatheodoris*, Major), equal in size to the largest members of the *Struthio camelus* group.

BERLIN.

Physical Society, November 30, 1888.—Prof. Kundt, President, in the chair.—Prof. Neesen spoke on a photographic method of registering the oscillations of projectiles. The conical end of the projectile is hollow, and at the point of it there is a small round opening; a sensitive photographic plate is placed in the cavity of the projectile. If the latter is now fired towards the shining sun, a ray of light must fall on the centre of the sensitive plate as long as the projectile moves horizontally; any deviation in a vertical or horizontal direction must produce an elongated image on the plate, and from this the deviation of the projectile from its true flight may be determined. If the projectile rotates in its flight a spiral will be obtained on the plate. The speaker had made some preliminary observations on rotating and vibrating hollow conical balls, and exhibited the negatives which he had obtained. The rotation of projectiles presents great difficulties, inasmuch as in a series of experiments the sensitive plate must not participate in the rotatory motion. The arrangements necessary for securing this result were described. Experiments as above described must be of the greatest interest in connection with the theory of projectiles, since up to the present time but little is known of the extent of the vertical and horizontal deviation during flight.—Prof. Neesen also gave an account of a stroke of lightning whose effects he witnessed while on a journey last summer. The lightning struck the centre of the roof of a two-storied house, passed along externally for a short distance, then made a round hole through the wall, and came upon the hook from which a mirror was suspended; it then passed over to the glass, fusing it at the upper corner, in the middle where the two halves of the glass joined, and at the lower opposite corner, and finally passed out again through a round hole in the wall below the glass. The way in which the latter was injured by the lightning was especially remarkable, as also was the way in which the lightning, instead of passing straight along the outside of the wall, made its way by one hole to the looking-glass in the room, and then passed out again by another similar opening.

Physiological Society, December 7, 1888.—Prof. du Bois-Reymond, President, in the chair.—Prof. Munk continued the communication which was interrupted at the last meeting of the Society, on the physiology of the thyroid.

December 21, 1888.—Prof. du Bois-Reymond, President, in the chair.—Dr. Barth gave a detailed description of his method of preparing the membranous labyrinth, and exhibited a series of preparations which had been made by this method. He intends to study fully the minute anatomy of the internal ear with the help of these preparations.—Dr. Weyl gave an account of his researches made with a view to determining the toxic or harmless action of the colouring-matters derived from tar. Inasmuch as the German Statute-book only forbids the use of two of these colouring-matters derived from tar as being poisonous, the speaker had made a systematic examination of an extended series of these colours, including such as might possibly be employed for the coloration of food-materials and might hence be a matter of dispute. He first tested the nitroso-and nitro-derivatives of benzol and phenol, and found the first to be non-poisonous, taking phenyl green as a typical representative. The nitro-derivatives which he examined—namely, picric acid, dinitro-kresol, and Martius's yellow—he found to be poisonous; the sulpho-compounds of the last-named colouring-matter, of which two are now articles of commerce—namely, naphthol-yellow S, and brilliant-yellow S—he found to be harmless. This fact points to a relationship between the chemical constitution and physiological action of these bodies. He busied himself further with an examination of the azo-colours, of which many hundred are used commercially. These fall naturally into two groups—namely, one in which the colouring substances contain only one azo-group, and a second in which they contain the azo-group twice, or as it may be called the Congo-group. These groups are distinguished physiologically by the fact that the first does not impart any colour to the urine, while the second does; they are further distinguished technically by the fact that the first group can only be used for dyeing by the help of a mordant, whereas the second does not require the use of any mordant. Dr. Weyl first investigated the action of substances containing one azo-group—namely, aurantia or imperial-yellow of commerce (hektanitro-diphenylamine); this colouring-matter was non-poisonous, and remained so after it had become soluble by the introduction of the sulpho-group (HSO_3) into its molecule. In the above researches the speaker used fibres of wool or silk, either mordanted or not according to the nature of the colouring-matter, for the purpose of determining their presence in the fluids and urine from the animals on which he was experimenting, dipping the threads into the fluids: he found that the commencing coloration of the fibres was the most certain sign of the presence of the colouring-matter.

Note.—In NATURE for December 13, p. 167, column 2, the sixth line from the bottom of the page, instead of "fall" read "rise."

AMSTERDAM.

Royal Academy of Sciences, December 29, 1888.—Mr. J. A. C. Oudemans criticized the value of the retrogradation of the plane of Saturn's ring, determined by Bessel in 1835, and generally adopted also for the plane of the orbits of the inner seven satellites of that planet. He remarked that Bessel's value 3″·848, being exceeded by its mean error, is not trustworthy. He prefers the theoretical value, for which he finds 0″·25.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

A Text-book of Elementary Biology: R. J. H. Gibson (Longmans).—Chance and Luck, new edition: R. A. Proctor (Longmans).—The Photographer's Diary and Desk Book, 1889 (Wyman).—A Text-book of Physiography: E. Hull (Deacon)—The Telephone: W. H. Preece and J. Maier (Whittaker).—Triennial Calendar of the Tungwen College (Peking).—Descriptive Catalogue of the Sponges in the Australian Museum, Sydney; R. von Lendenfeld (Taylor and Francis).—Corona; the Bright Side of the Universe: F. T. Mott (Williams and Norgate).—Manual of Orchidaceous Plants, Part 4, Cypripedium (Veitch).—Explosion of an Air Receiver at Ryhope Colliery (Newcastle-upon-Tyne).—The Anatomy of Megascolides australis (the Giant Earth-worm of Gippsland): W. Baldwin Spencer (Melbourne).—Journal of Anatomy and Physiology, January (Williams and Norgate).—Mind, January (Williams and Norgate).—Quarterly Journal of Microscopical Science, December (Churchill).—Quarterly Journal of Royal Meteorological Society, October (Stanford).—Geological Magazine, January (Trübner).—Journal of Society of Telegraph Engineers and Electricians, No. 75, vol. xvii. (Spon).—Journal of the College of Science, Imperial University, Japan, vol. ii. Part 4 (Tōkyō).—Proceedings of the Society for Psychical Research, Part 13 (Trübner).

CONTENTS.

PAGE

The Late William Denny. By **Francis Elgar** . . 241
Memory. By **Dr. W. C. Coupland** 244
The Species of Ficus of the Indo-Malayan Archipelago 246

Our Book Shelf:—

Lœwy: "Questions and Examples on Elementary Experimental Physics" 247
James: "The Unknown Horn of Africa" 247
Abercromby: "Seas and Skies in Many Latitudes" 247

Letters to the Editor:—

Alpine Haze.—**Antoine d'Abbadie; Dr. George F. Burder** 247
On the Use of the Words "Mass" and "Inertia"—a Suggestion.—**Prof. A. M. Worthington** . . . 248
Eight True Ribs in Man.—**Prof. D. J. Cunningham** 248
"The Cremation of the Dead."—**A. B. Basset** . . 249
"Degradation" of Energy.—**H. G. Madan** . . . 249
Hares Swimming.—**Octs. Deacon** 249
The Recent Solar Eclipse 249
Recent Works on Algæ. By **Mrs. Mary P. Merrifield** 250
The Journal of Morphology 252
The Bald-headed Chimpanzee. (*Illustrated.*) 254
Notes 255
Astronomical Phenomena for the Week 1889 January 13–19 258
Geographical Notes 259
Some Annelidan Affinities in the Ontogeny of the Vertebrate Nervous System. (*Illustrated.*) By **Dr. J. Beard** 259
The Journal of the Royal Agricultural Society . . 261
A Relic of Ancient Mexico 262
Scientific Serials 262
Societies and Academies 262
Books, Pamphlets, and Serials Received 264